Exposure to organophosphate pesticides and neurobehavioral performance among paddy farmers in Tanjung Karang, Selangor

ABSTRACT

Objective: Pesticides are widely used throughout the world especially in the agriculture and pest control as well as for community health purposed. Agriculture workers are exposed to pesticide primarily throughout mixing, spraying, loading and cleaning up pesticide containers. The study aim was to determine whether pesticide exposure biomarker, blood cholin- esterase level would affect the neurobehavioral performance of the paddy farmers. Method: To fulfill this objective, a total of 94 of paddy farmers as exposed group and 30 farmers as control group participated in this study by completing a set of questionnaire, capillaries blood were collected from finger prick technique and neurobehavioral score determined using WHO Neurobehavioral Core Test Battery (NCTB). Result: Results showed that mean of blood cholinesterase level for exposed group (34.84) was significantly lower than the control group (88.33). The mean NCTB score for exposed group was 357.87 while for the control group was 369.67. There was a significant difference ($p< 0.05$) between both groups for Trial Making Test and Pursuit Aiming Test. The duration of employment (year) was the most significant variables related to the cholinesterase level ($p < 0.001$), in which, it significantly influenced the Benton Visual Retention Test ($p = 0.025$). The education level was significantly related to the Digit Symbol Test ($p = 0.023$), and the duration of employment (year) significantly related to Santa Ana Manual Dexterity Test ($p = 0.017$). Conclusion: In conclusion, duration of employment (year) significantly influenced the blood cholinesterase level which was related the Benton Visual Retention Test score, while the education level significantly influenced the Digit Symbol Test. The duration of employment (year) significantly related to the Santa Ana Manual Dexterity Test.

Keyword: Pesticide; Neurobehavioral test; Cholinesterase enzyme